

# Wood River Groundwater Model Development: Design Documents Update

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Wood River MTAC June 5, 2014



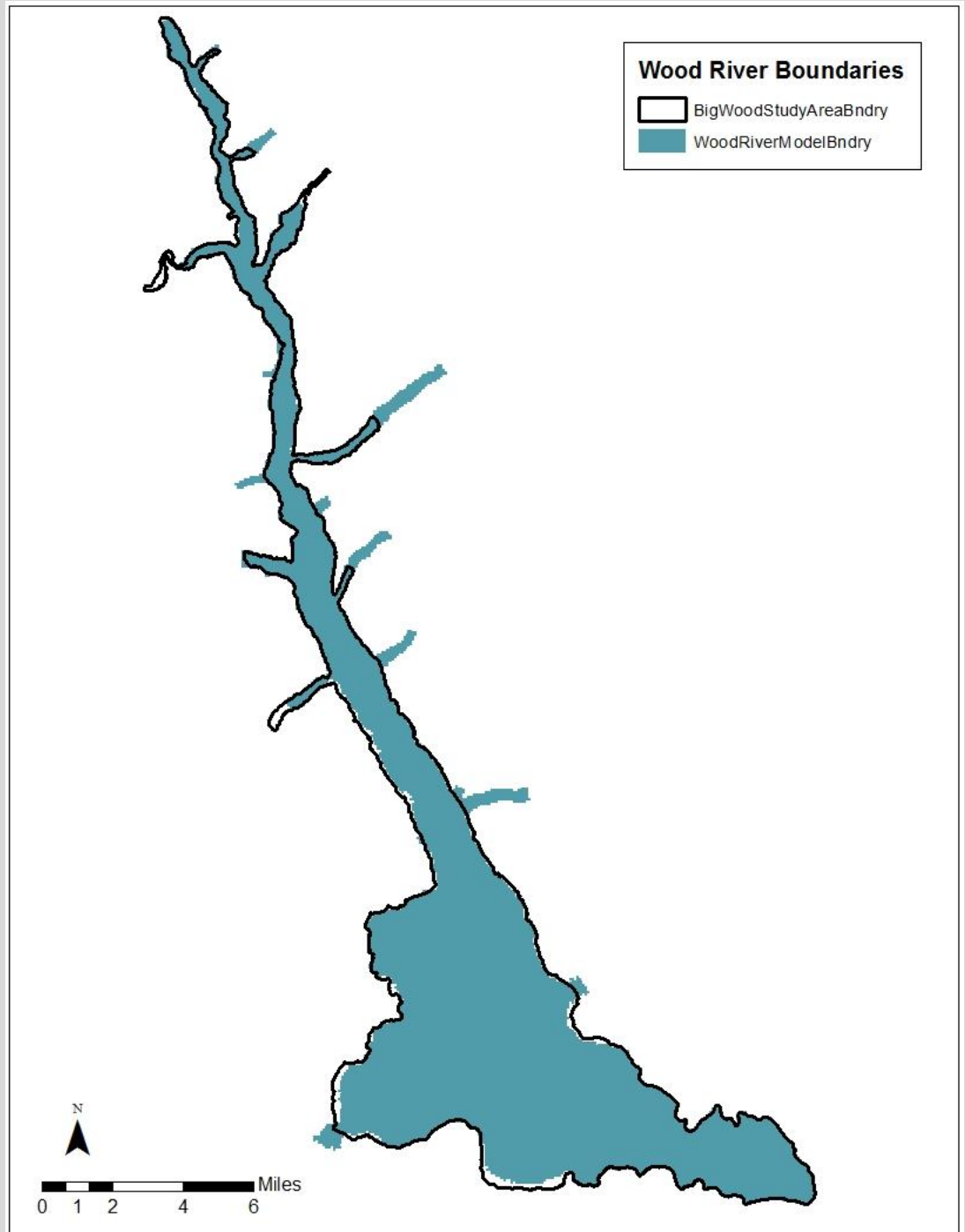
## General Notes on Design Documents

- Design Documents intended to exist as DRAFT to allow for changes as modeling progresses.
- Draft version numbers indicate how many reviewers/revisions have taken place.
  - **Design Document\_WRV\_Precipitation\_DRAFT6.docx**: Indicates that the document has been revised 5 times.
  - **Design Document\_Irrigation\_Season\_ET\_DRAFT3.docx**: Indicates that that the document has been revised twice.
  - **Design Document\_WinterET\_DRAFT1.docx**: Indicates that only the author has seen the document.
  - Design Document on non-irrigated runoff and recharge not completed yet.

The boundaries in my DRAFT documents currently use the BigWoodStudyAreaBndry.

The active model is represented by the WoodRiverModelBndry.

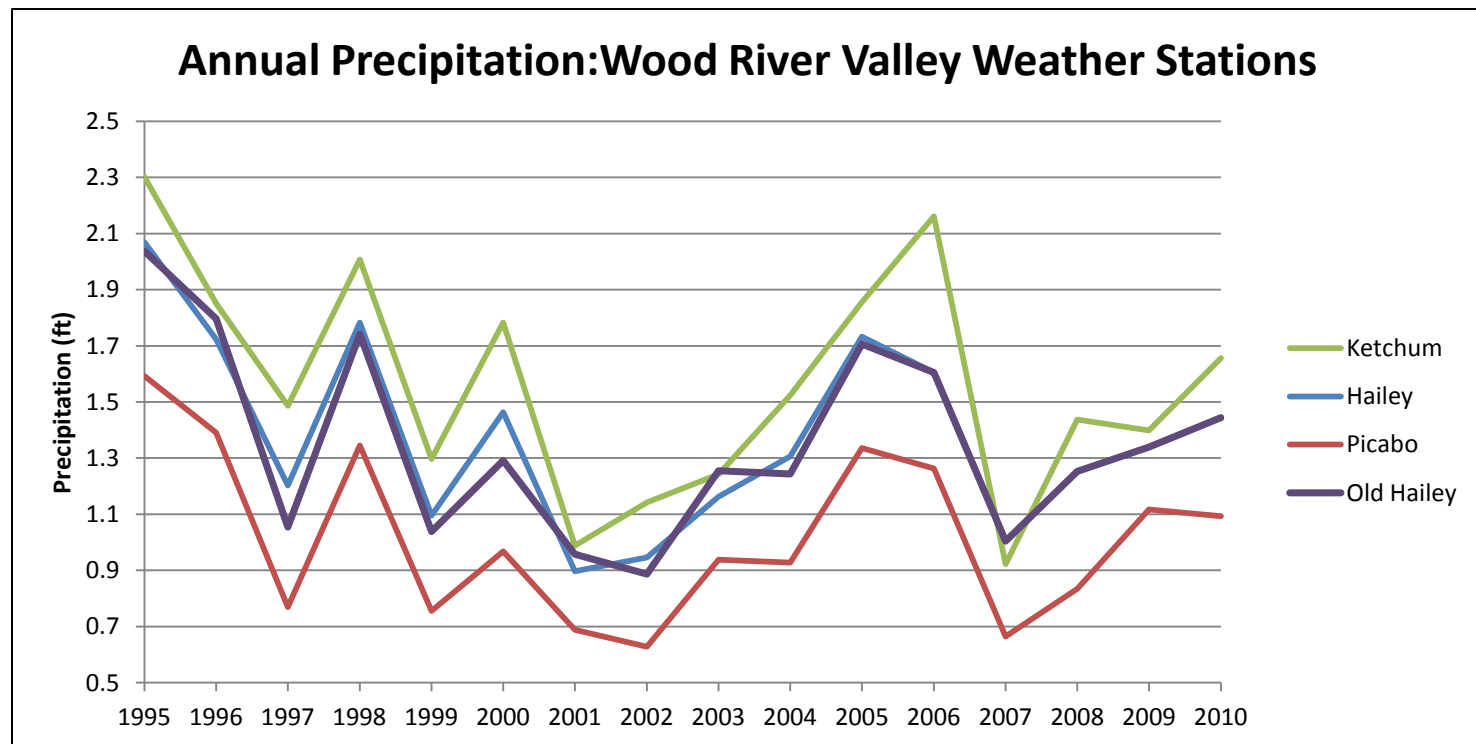
Design Documents will be updated to reflect model boundary.



## Changes to Precipitation Estimation

### Estimating Precipitation at Hailey for 1995-2004:

- Previously reported using a correlation between Picabo and available Hailey Data.
- Currently using correlation between the average of Ketchum and Picabo and available Hailey Data.





## Freezing and Melting of Winter Precipitation

Ketchum melt occurs in April.

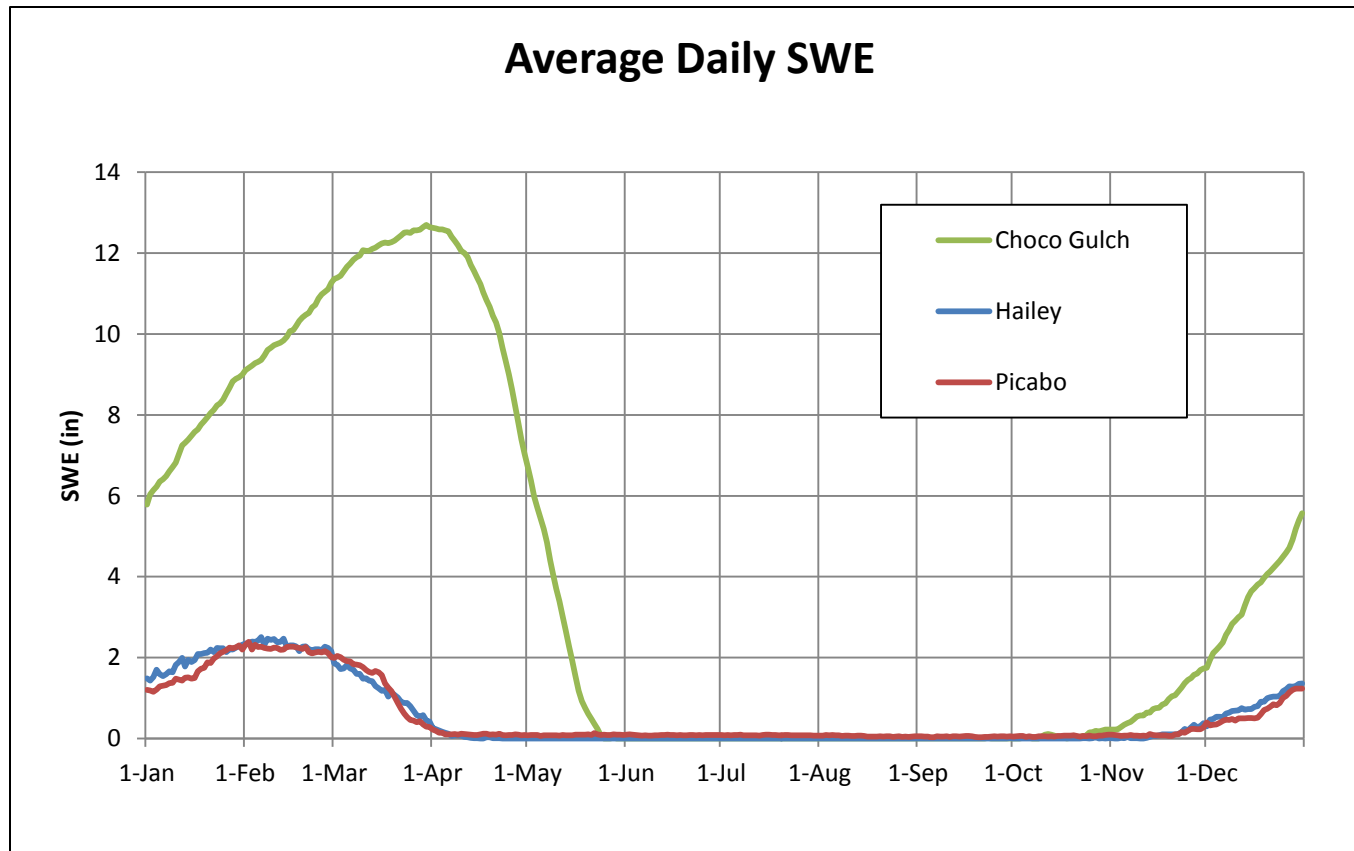
Hailey melt begins in March and ends in April.

Picabo melt begins in March and ends in April.

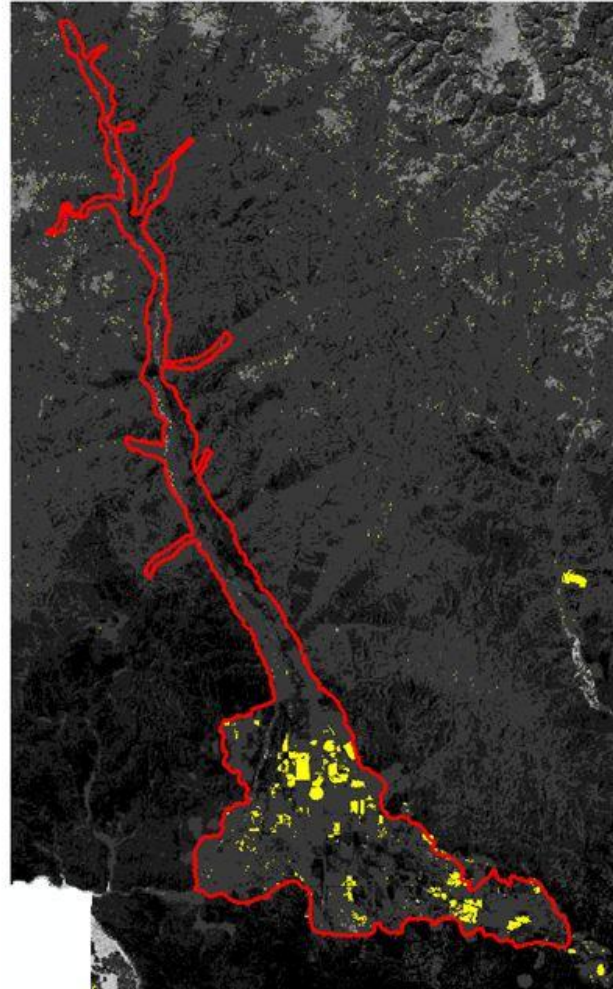
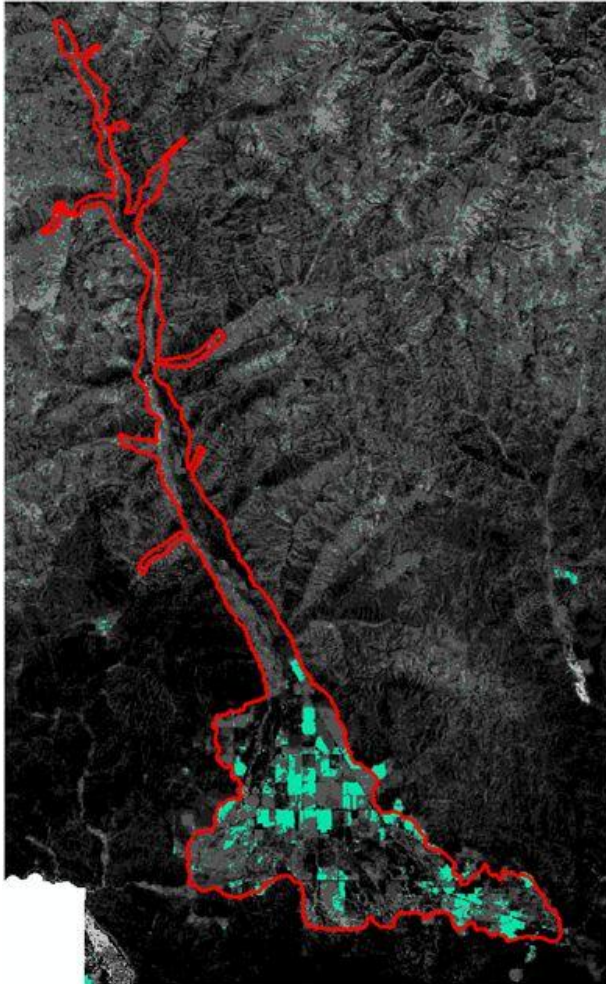
|         | Nov      | Dec      | Jan      | Feb      | Mar  | Apr  |
|---------|----------|----------|----------|----------|--|--|
| Ketchum | 0.25 Nov | 0.25 Dec | 0.25 Jan | 0.25 Feb | 0.25 Mar                                       | 0.75Nov + 0.75Dec + 0.75Jan + 0.75Feb + 0.75Mar + 1.0Apr |
| Hailey  | 0.75 Nov | 0.25 Dec | 0.25 Jan | 0.50 Feb | 0.25Nov + 0.75Dec + 0.75Jan + 0.50Feb + 1.0Mar | 1.0Apr   |
| Picabo  | 0.75 Nov | 0.25 Dec | 0.25 Jan | 0.75 Feb | 0.25Nov + 0.75Dec + 0.75Jan + 0.25Feb + 1.0Mar | 1.0Apr   |

Winter Precipitation has been delayed” to simulate freeze/melt. Monthly percentages altered based on snow accumulation.

## Snow Accumulation for Winter Precip Freeze/Melt



## Changes To ET Interpolation



## Changes To ET Interpolation (cont'd)

- Interpolation of ET generally results in reasonable ET estimates.
- ET in some areas much too high.
- Previously adjusted to Alfalfa ET from ET Idaho.
- Errors previously thought to occur on irrigated land, appeared to be related to crop cycle/water supply.
- On further examination, errors may be systemic with interpolation method.
  - Got lucky with many of the interpolated values?
- New method to be vetted with Dr. Allen. Propose to use average ETrF from METRIC images in combination with weather data.



## Changes to Winter ET

Previously proposed using a relationship between Mackay and Picabo, and adjusting Picabo ET data to obtain Ketchum winter ET.

Currently using Mackay directly as a proxy for Ketchum winter ET.

| Station                | Elevation |
|------------------------|-----------|
| Picabo Agrimet         | 4900      |
| Hailey Range Station   | 5350      |
| Ketchum Ranger Station | 5890      |
| Mackay Ranger Station  | 5910      |

| Average Fraction of Picabo | Nov  | Dec  | Jan  | Feb  | Mar  |
|----------------------------|------|------|------|------|------|
| Hailey                     | 1.01 | 1.02 | 0.98 | 0.92 | 0.74 |
| Mackay (sub for Ketchum)   | 0.77 | 0.92 | 0.88 | 0.81 | 0.70 |

## Runoff and Recharge on Non-Irrigated Lands and on All Lands During Non-Irrigation Season

Design Document is in progress. Will document how recharge and runoff are calculated in the absence of irrigation.

Discussion.